

Wind Speed

Topic: Atmosphere

Objectives: Determine the speed of the wind

Grade Level: 4 -12

Time: 10 – 15 minutes

Materials: windy or breezy day, balloons, ping pong balls, fishing line, protractors, small bubble levels, large sewing needle, silicone glue, writing pads, pens or pencils

Vocabulary:
indicator
velocity
bubble level
protractor
elevation
hypothesis

Location: various locations in Piedmont Park

Background: Wind is moving air. Air flows from areas of high pressure to areas of low pressure much like the air rushes out of a blown-up balloon when you open up the end. The wind is strong and gusty when there is a big difference in air pressure between two areas. When the difference in air pressure is small, the wind is light and breezy. In this activity, you will use homemade wind indicators to determine the speed of the wind.

Advance Preparation: Make homemade wind indicators or have the students make their own.

Directions for making wind indicators: Thread a long sewing needle with about 30 centimeters (12 inches) of fishing line and push the needle all the way through a ping pong ball. Tie a knot in the fishing line on the side of the ball where the needle came out. Place a dot of glue on the knot to keep it from unraveling. Glue the other end of the fishing line to the exact center of the straight edge of a protractor. Glue a small bubble level to the straight edge of the protractor.

Procedure:

1. Blow up a balloon and hold tightly to the open end until all your classmates have blown up their balloons. Your teacher will count to three after all the balloons are filled. On the count of three, release your balloon.

2. Now, together with a partner, collect a wind indicator from your teacher or activity leader. Practice using the wind indicator with your partner. To use the wind indicator, face into the wind and hold the wind indicator so that the straight side is on top with the ping pong ball hanging down. Point the protractor into the wind. (The side of the protractor with the written scale on it should be facing right or left.) Tilt the wind indicator until the bubble in the level is centered between the black lines. Let the ping pong ball blow in the wind. Record the angle at which the fishing line crosses the protractor's scale.
3. Walk with your partner to several different areas in Piedmont Park. At each location, take another measurement with your wind indicator. Try to measure the wind at different elevations and under trees as well as in the open. Record your location and the angle measure.
4. Use the chart to convert the angle to wind velocity. Record the wind velocity for each location.

ANGLE TO WIND VELOCITY

Angle	Approximate Wind Velocity (m/s)	Approximate Wind Velocity (km/hr)	Approximate Wind Velocity (miles/hr)
90.0°	0.0	0.0	0.0
87.5°	2.0	7	4
82.5°	3.0	11	6
77.5°	4.0	14	9
75.0°	4.5	16	10
70.0°	5.0	18	11
67.5°	5.5	20	12
65.0°	6.0	22	13
62.5°	6.5	23	14
60.0°	7.0	25	15
57.5°	7.5	27	16
53.5°	8.0	29	17
50.0°	8.5	31	18
47.5°	9.0	32	19
45.0°	9.5	34	21

Questions to think about and discuss:

1. Describe what happened when you and your classmates released the blown up balloons? What do you think caused this motion? Before you released your balloon how did the air pressure in the balloon compare to the air pressure outside the balloon? How did it compare after you released the balloon?
2. Compare the wind velocities that you found at the different locations in the park. Where was the wind the strongest? Where was it the lightest? What physical features of the locations do you think might have caused these differences? Considering that wind is moving air, discuss why these physical features might cause the wind to increase or decrease.
3. How do your findings compare with your classmates? Try to create a hypothesis about how physical land features influence wind velocity.